

IN THE CLAIMS:

The following Listing of Claims replace all prior listings, and versions, of claims in the above-identified application.

Listing of Claims

- 1-43. (Cancelled)
44. (Currently Amended) A method to protect an animal from a disease or condition that can be treated by alpha interferon, comprising administering to an animal having said disease or condition a composition comprising a cysteine variant of alpha interferon-2 of SEQ ID NO: 3, wherein said alpha interferon-2 cysteine variant comprises at least one cysteine residue ~~substituted~~ substituted for at least one amino acid located in at least one region of alpha interferon-2 selected from the group consisting of: the B-C loop, the C-D loop, the D-E loop, the first three or last three amino acids in helix A, the first three or last three amino acids in helix B, the first three or last three amino acids in helix C, the first three or last three amino acids in helix D, the first three or last three amino acids in helix E, the amino acids preceding helix A, and the amino acids following helix E.
45. (Original) The method of Claim 44, wherein said cysteine variant comprises at least one cysteine residue substituted for an amino acid selected from the group consisting of: D2, L3, P4, Q5, T6, S8, Q20, S73, A74, A75, D77, E78, T79, Q101, G102, G104, T106, E107, T108, P109, M111, K112, E113, D114, S115, K131, E132, K133, K134, Y135, S136, A139, S152, S154, T155, N156, L157, Q158, E159, S160, L161, R162, S163, K164, and E165.
46. (Original) The method of claim 44, wherein said cysteine variant comprises at least one cysteine residue substituted for at least one amino acid located in the region of alpha interferon-2 preceding helix A.
47. (Original) The method of claim 46, wherein said cysteine variant comprises at least one cysteine residue substituted for at least one amino acid selected from the group consisting of D2, L3, P4, Q5, T6, and S8.
48. (Original) The method of Claim 46, wherein said cysteine variant comprises a cysteine residue substituted for Q5.
49. (Original) The method of claim 44, wherein said cysteine variant comprises at least one cysteine residue substituted for at least one amino acid located in the C-D loop of alpha interferon-2.
50. (Original) The method of claim 49, wherein said cysteine variant comprises at least one cysteine residue substituted for at least one amino acid selected from the group consisting of Q101, G102, G104, T106, E107, T108, and P109.
51. (Original) The method of Claim 49, wherein said cysteine variant comprises a cysteine residue substituted for M111.

52. (Original) The method of Claim 44, wherein said composition is administered by a route selected from the group consisting of intravenous administration, intraperitoneal administration, intramuscular administration, intranodal administration, intracoronary administration, intraarterial administration, subcutaneous administration, transdermal delivery, intratracheal administration, intraarticular administration, intraventricular administration, inhalation, intranasal, intracranial, intraspinal, intraocular, aural, intranasal, oral, pulmonary administration, impregnation of a catheter, and direct injection into a tissue.

53. (Original) The method of Claim 44, wherein said composition is administered by intravenous administration.

54. (Original) The method of Claim 44, wherein said composition is administered by subcutaneous administration.

55. (Original) The method of claim 44, wherein said cysteine variant of alpha interferon-2 is modified with a cysteine-reactive moiety.

56. (Original) The method of claim 55, wherein said cysteine reactive moiety is a polyethylene glycol.

57. (Original) The method of claim 44, wherein said disease is cancer.

58. (Original) The method of claim 44, wherein said disease is a viral disease.

59. (Original) The method of claim 58, wherein said viral disease is selected from the group consisting of Hepatitis B and Hepatitis C.

60. (New) The method of claim 57, wherein said cancer is selected from the group consisting of leukemia, melanoma and Kaposi's sarcoma.

61. (New) The method of Claim 57, wherein administration of the composition inhibits growth of tumor cells.

62. (New) The method of Claim 58, wherein administration of the composition inhibits viral growth.

63. (New) The method of Claim 49, wherein said cysteine variant comprises a cysteine residue substituted for Q101.

64. (New) The method of Claim 49, wherein said cysteine variant comprises a cysteine residue substituted for T106.

65. (New) The method of Claim 49, wherein said cysteine variant comprises a cysteine residue substituted for E107.

66. (New) The method of claim 44, wherein said cysteine variant comprises at least one cysteine residue substituted for at least one amino acid located in the region following helix E of alpha interferon-2.

67. (New) The method of 66, wherein said cysteine variant comprises a cysteine residue substituted for S163.

68. (New) The method of claim 44, wherein the arginine at position 23 with respect to SEQ ID NO:3 is substituted with a lysine.

69. (New) The method of claim 49, wherein said cysteine variant of alpha interferon-2 is modified with a cysteine-reactive moiety.

70. (New) The method of claim 69, wherein said cysteine reactive moiety is a polyethylene glycol.